RISK MANAGEMENT IN BALTIC LOGISTICS

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Abstract

The management of logistics risk in drink distribution, as in other business sectors of the Baltic States, is of great importance, especially in today's conditions of economic depression. Logistics risks have a significant influence on customer service level and profitability. Distribution of beverages and other commodities in the Baltic States is affected by present low consumption levels as well as the small size of the three countries' interconnected markets.

The trends of the beverage market in the Baltic States have been established. The distribution and delivery systems of "Coca-Cola Hellenic Bottling Company" *have been analyzed, from the bottling plants to the retail customers and end users. The fluctuations of customer demand by seasons and days of the week have been determined.*

Solutions have been found for optimal logistics risk and for the ratio between the customer service levels and the logistics cost. In practice, the largest savings have been achieved by reducing the number of warehouses and the use of transportation outsourcing.

Key words: *Risk management, logistics, Supply Chain Management (SCM), daily products distribution*

1. Pan-Baltic distribution system for consumer goods

Distribution of daily products in Baltic (Estonia, Latvia and Lithuania) has some specifics as compared with other EU countries (Handfield *et al.*, 2009; Langley *et al.*, 2009). International brand representatives mainly operate in the Pan-Baltic mode due to small market size – the total population of all three Baltic countries is 5.5 times smaller than in Poland – the country of similar GDP per capita. Sometimes International companies do not have one central legal body, but in all the cases coordination and cooperation take place. Usually management is of vertical structure, or at least with one leading institution. We can see examples of Pan-Baltic business operations in trade, service, banking and in other business activities. Such management structure is more efficient; however it is more complicated due to a greater number of parameters to be controlled.

The Baltic distribution of various consumer goods has common features (Круминьш & Витолиньш, 2007). Distribution networks of International companies have direct interaction with production plants mainly located outside the Baltic region, at least in the supply of spares. The definition of Supply Chain Management (SCM) system is wider than that of a distribution system, by including more functional links. The aim of the study is to analyse the Pan-Baltic SCM of daily products, evaluate the operational parameters for the distribution system and find the solution how to reduce the business risks.

Consider the consumption of non-alcoholic drinks in Baltic. Being quite small, Baltic's region is nonetheless highly complicated. It embraces three countries with different cultures, languages, legislation, taxes and consumption history. For example, Latvian wholesalers are not permitted to make payments in cash[1], however in other countries the sales via cash make up a reasonable portion of all sales. Another example – it is forbidden to return empty packing to wholesalers in Lithuania, but is allowed in Estonia and Latvia. So far, plastic reusable package products are not much used to distribute the Coca-Cola products.

There are two main beverage groups: with and without sugar.

From Table 1 we can derive graphs of personal consumption - see Figure 1 and Figure 2. The cause is that the market development was stable and predictable in the last six years. We also evaluated the effect of economic decline – decrease in the purchase power since year 2008. The general tendencies now are stable consumption of soft drinks and moderate growth about 45% in six years of the "non-sugar" drinks consumption.

[1] There are erratic changes in Baltic retail legislation.

Table 1: Consumption of beverages in Baltic, data from Eurostat

Statistics on the production of manufactured goods Sold Volume ANNUAL, 1000 litres						
NACE code Rev.2	11071130	Mineral waters and aerated waters, unsweetened				
Area /Year	2003	2004	2005	2006	2007	2008
EE	27227	25890	25501	31772	37709	37634
LV	67994	70872	68280	81944	68041	55526
LT	65694	56080	82605	108627	122591	123584
Baltic	**160915**	**152842**	**176386**	**222343**	**228341**	**216744**
EU-27	45836487	45431238	43444343	49644479	54000000	48000000
Poland	1932085	1811295	2291862	2557591	2621668	2708438
NACE code Rev.2	11071930	Waters, with added sugar, other sweetening matter or flavoured, i.e. soft drinks (including mineral and aerated)				
Area /Year	2003	2004	2005	2006	2007	2008
EE	80358	77925	107974	130610	124003	112473
LV	29786	30242	35056	36103	42291	36567
LT	155368	139360	154222	138518	133667	107240
Baltic	**265512**	**247527**	**297252**	**305231**	**299961**	**256280**
EU-27	33300000	33077830	32298107	35000000	34800000	35266908
Poland	2404682	2478250	2419279	2711321.3	2806059	2955666

Unsweetened water is used more in Latvia, but in Estonia waters with sugar are preferred. The Lithuanian consumption behaviour is of "average" Baltic. We can also see the difference of beverage volumes consumed in the Baltic and in the EC. Unsweetened water consumption is growing twice as fast in Baltic, than in EU-27 and Poland. The reason is the lower Baltic absolute consumption level, now it is about half of the EU-27 average for unsweetened waters, and about three times less for waters with added sugar. Interesting, that soft drinks per capita are used in the same volumes in the EU-27 and in nearby Poland with similar economical development level. For proper supply chain management we have to take into account the behaviour and habits of population.

The expectation is that the Baltic market of unsweetened drinks will be growing in volume and potentially have increased possibilities and risks.

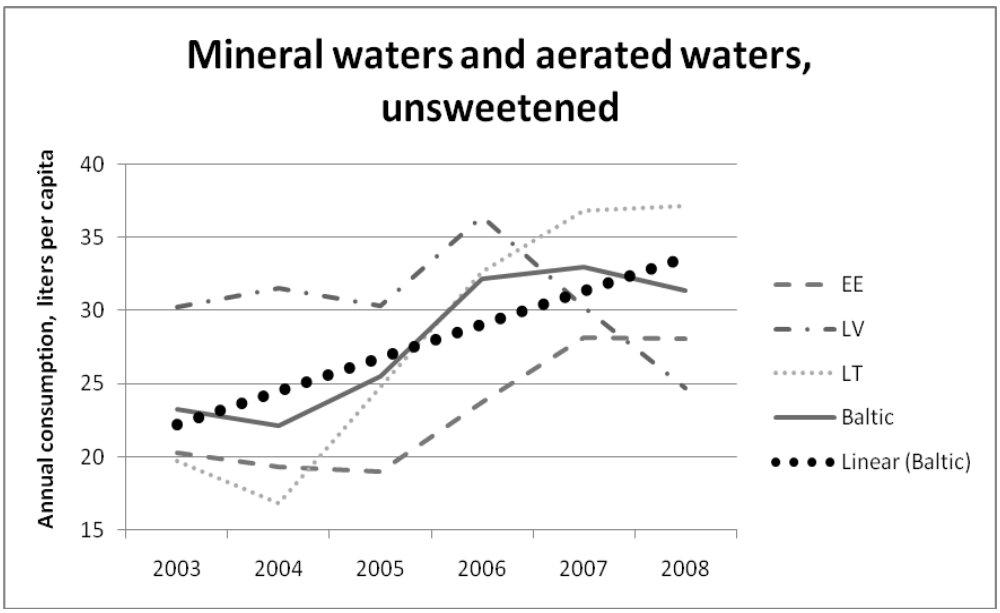

Figure 1: Consumption of unsweetened drinks in Baltic

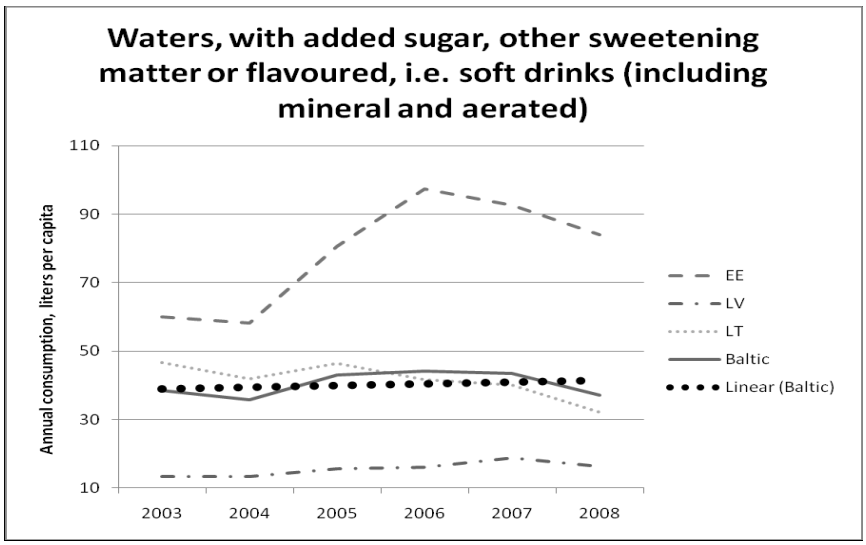

Figure 2: Consumption of soft drinks in Baltic

We will consider the Coca-Cola products distribution in the Baltic region as an example of the Pan-Baltic consumer goods distribution system. Founded in 1886, the Coca-Cola Company is the world's leading manufacturer, marketer, and distributor of non-alcoholic beverage concentrates and syrups used to produce more than 230 beverage brands in more than 200 countries. Coca-Cola concentrate produced in the USA is delivered to the licensed Coca-Cola bottlers throughout the world, where it is processed into the end products – soft drinks. The bottlers who hold territorially exclusive contracts with the company produce and package finished products into cans, glass and PET bottles from the "concentrate" in combination with filtered water and sweeteners. The bottlers then sell, distribute and market a diverse range of ready-to-drink non-alcoholic beverages in the sparkling, juice, water, sport, energy, tea and coffee categories to retail stores and vending machines.

The Baltic area is the territory under the exclusive operations of Coca-Cola Hellenic Bottling Company (CCHBC), which operates totally in 28 countries of Western, Central and Eastern Europe, as well as Nigeria and Russia - see Figure 3: "Operation area of Coca-Cola Hellenic Bottler Company", where markets are highlighted by consumption (Baltic countries are in the "developing markets" group). CCHBC is one of the world's largest Coca-Cola bottlers and as a multinational company, has well developed standards of business process. So we can find in the Baltic coke distribution system the general features of Coca-Cola SCM systems and distinguish the Baltic distribution specific points. The Supply Chain in Coca Cola HBC Baltic means manufacturing, warehousing, distribution, transportation, quality, planning and procurement.

Figure 3: Operation area of Coca-Cola Hellenic Bottler Company.

2. Logistics risks

Coca-Cola clients in Baltic are over 15,000 direct retail customers with full distribution services. The bottler takes orders, arranges delivery to the outlets and stocks the products. The measure of distribution system efficiency is service level - customer satisfaction. Today Coca-Cola customers request for a delivery time within working day from the moment of ordering. Supply time cycle from retailer inquiry through production in Baltic plants to delivery to end users is about 1 week. So safety stock of beverages must be not less than week consumption. Now it is valued of 12 – 14 days consumption. Such stock level reduces the risk of stock out. Delivery plan is for a month with correction on weekly basis. CCHBC is an owner of goods and can operate the inventory with relative low costs. Coca-Cola beverages has expire duration times from 3 months (products for HoReCa) till 1 year. Long shelf life and absence of special storage requirements provide low risks of warehousing and product expiry.

Assortment of CCHBC products is not wide – about one and half hundred product lines. Classical Pareto classification of products into groups A, B and C with various contributions to performance parameters helps to be concentrated on the most important products.

Some of the main parameters of performance of Coca-Cola Baltic Logistics are as follows:

1. Warehousing costs per case.
2. Distribution costs per case.
3. Picking efficiency in DC
4. System stock losses.
5. Truck day average.
6. Not delivered cases due to Logistics faults.

Delivery trucks with a capacity of 20 T do a haulage from plants to warehouses, distribution trucks of 10 T do a transportation to retailers. Only small part of plant output, less than 5%, is going directly to large users, big outlet chains, without storage at warehouse. So we can take into transport calculations only inbound and outbound from warehouses to customer. Transport costs are substantial part of all logistics costs and are depending on variable customer demand. Drinks demand fluctuation has two main influencers – weekdays and weekly. Let's consider the transport needs changes during the weekdays. As an example, in Figure 4 we can see the number of distribution trucks in three randomly selected weeks.

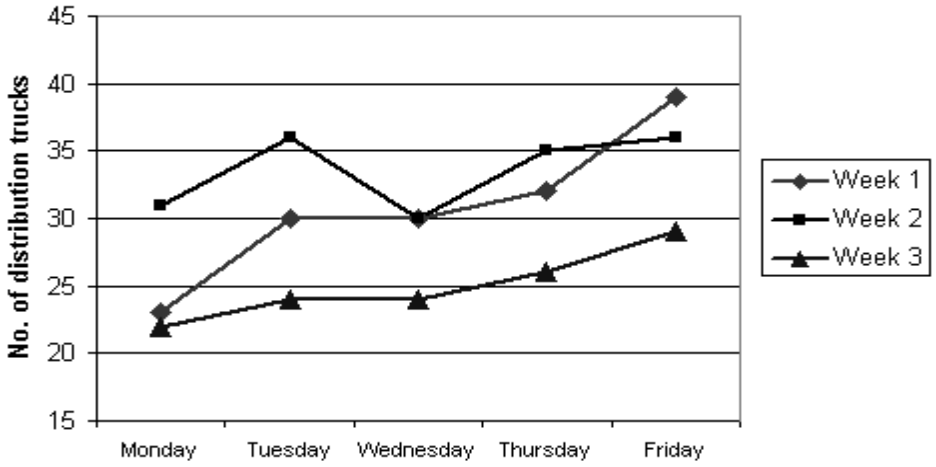

Figure 4: Coca Cola HBC Lietuva distribution activities through a week.

We can evaluate that the daily consumption of products is 30% up to the end of a week as compared with its beginning. Such relations are valid through all year, with weekly consumption changes due to seasonality (its influence is shown in Chart 4 for 2009). The

number of weekly used distribution trucks is highly variable from week to week. We can evaluate the relation by comparing the annual average and the moving average for 4 weeks that is practically the month average.

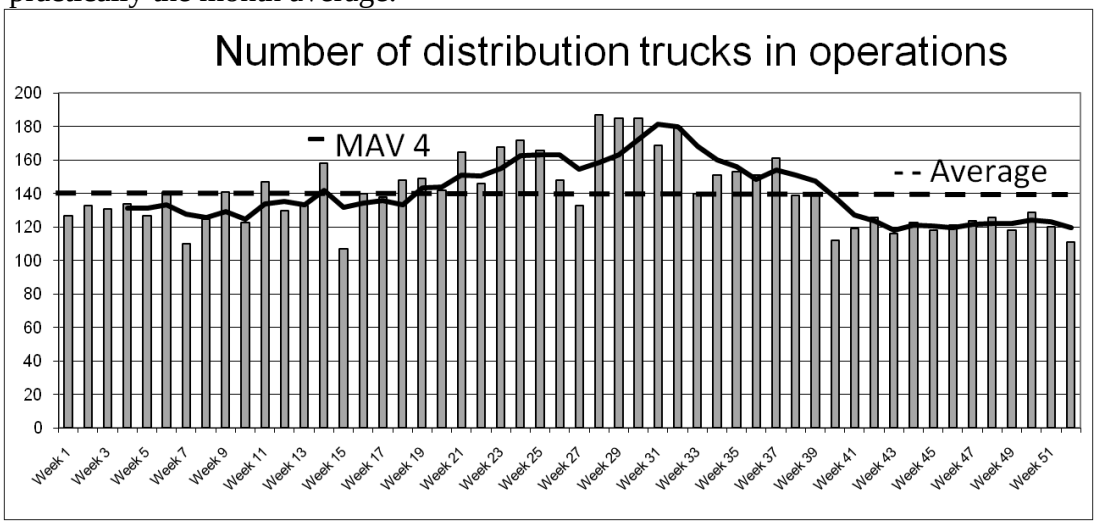

Figure 5: Coca Cola HBC Lietuva distribution activity in 2009

Demand for drinks has seasonal peaks up to 100% at summer and is smaller at Christmas. As seen from Figure 5, the need for distribution trucks has the peak summer seasonality of 28.5%. The discrepancy between the actual goods delivery and the number of trucks in operation can be explained by smaller truck loads in non-peak seasons. Parameters of demand fluctuations are important for transport needs forecasting.

The customers want high levels of service, so meeting their expectations is essential both to the customer loyalty and to creation of competitive advantage. However, such service cannot be rendered without regard to its costs. Basing the customer service levels (measuring the share of a retailer's orders completed on time and in full) on their segmentation would enable the tailored offerings.

Currently, in Baltic the beverage trade risks can be divided into external and internal logistics risks (Damodaran, 2008). We have to take into account the firsts and have to manage the lasts.

The main ***external risks*** are: financial, demand, legal and outsourcing.

Financial risks. Baltic countries have fixed currency exchange rates to Euro, so there are no risks of the kind. Today financial risks are associated with financial stability of customers and suppliers, especially in today crisis situation. The financial risk also depends on the transport fleet conditions, drivers, fuel prices, fuel consumption control, etc. Unfortunately the international insurance for such risks (for example to outsourcing service) has gone out of Baltic's today.

Demand risks related to unpredictable or misunderstood customer. Historical data of sales volumes allow evaluation of risks connected with seasonal variations in demand. So risk for out-stock due to seasonal peaks can be economically reduced by reasonable inventories and reaching a better match between the stochastic demand and the supply. It was revealed that the risks with the peak demand of extra-large orders are lower with a smaller number of warehouses – respectively, with lower probability of out stocking.

Also, the average demand of trucks in summers and winters differs more than 50%. This makes distribution very difficult, with almost impossible management of the same level of costs during a whole year.

Legislation risks in Baltic have increased due to quite often changes of terms and rules. In particular, changes of state regulations and laws, tax levels and transportation rules bring about additional costs and call for a careful monitoring of legal terms in all three countries.

Outsourcing risks are connected with the currently observed tendency to reduce the involved capital. The number of Contractors should be as big as could be managed without additional resources and loss in quality. At the same time, this number should not be very small. In the case of just a few contractors the Company is at risk of capacity shortage during a peak season and of possible rise in prices if the market changes are too swift.

Advantages of the outsourcing distribution:

1. Lesser number of employees.
2. No demand to invest into the fleet management system.
3. 95% of distribution costs become flexible.
4. Simpler quality management.
5. Smaller capital involved.

Disadvantages of the outsourcing distribution

1. No direct control of drivers
2. Risk to have worse service

Internal risks are driven by events within the CCHBC Baltic's control and are connected with facilities, inventory, internal processing of goods (warehousing and material handling), pricing and customer service.

Risks with facilities are determined by the number of warehouses and plants, their capacity, utilization and labour force. The first factor of these risks has been studied and practical decision implemented. The simulations and calculations are described in Part 3. The manufacturing risks are caused by disruptions of internal operations or processes. These have become very critical after the Baltic remained with only one manufacturing plant.

Inventory risks affecting the distribution system's performance are connected with regular inventory, safety stock and seasonal inventory. The basic point in determination of the inventory volume is the level of product availability. Proper operation of IT systems can reduce the needs for extra-ordinary stock replenishment. Planning of stock volumes in the Central warehouse reduces the risks caused by inadequate assessment and ineffective sales management. Forecasts should take into account the stochastic nature of demand and future changes of product assortment. An up-to-date SCM system should meet the rising demand for product variety.

Risks of warehousing and material handling (MH) are internal risks connected with stock rotation of products through warehouse. Part of product flow, cross- docked at warehouse docks for large retailers, is not affected by these risks. One of the aggravating factors is obsolescence of goods. In our case obsolescence practically is not connected with expire dates, they are quite long for soft drinks in general. Only especial attention should be devoted to the HoReCa products.

Pricing and customer service risks are closely connected. Pricing of SCM logistics costs affects the customer satisfaction. Today's level of IT systems allows us to manipulate price in the on-line mode, when the sales agent is at a customer's site. For example, it is possible to meet a retailer's request as to the specific price by changing the volume of order.

3. Reduction of risks in the distribution of beverages in Baltic

The opportunities to reduce the logistics risks are hidden in changing the number of warehouses and using the outsourcing for transport (Chopra and Meindl, 2010).

The CCHB Baltic has bottling plants in Tallinn (Estonia) and Alytus (Lithuania). The locations were selected during historical development of the business activities. Bottling plants for Coca-Cola do not involve very high fixed costs. So it is possible to locate a warehouse not far away from a bottling plant.

In 2008, six CCHBC warehouses were located in Baltic. The reason for Central Estonian warehouse location in Tallinn is very simple – it is close to the Tallinn bottling plant and is in the biggest sales area. The same situation is in Latvia (the central warehouse is located in Riga ─ capital city with more than 70 % of the country sales).

The Coca Cola HBC Baltic changed its distribution all over the Baltics in 2009 by reducing the number of warehouses from 6 to 3, with only one warehouse per country left: in Tallinn, Riga and Kaunas. This led to reducing the product life cycle and affected the inventory level. The number of warehouses became the same as that for largest retailers in Baltic. By these changes Company reduced also the number of employees, trucks and MH fleet. However, the main advantage is that the Logistics setup has become more flexible to changes on the market.

The Company made decision to move the central warehouse in Lithuania from Vilnius to Kaunas, located in the centre of country and having very good links with other regions. Apart from that, the sales in Lithuania are more evenly distributed among all regions, with no single dominated region. New premises near Kaunas are of modern warehouse design and have plenty parking spaces for freight transport and motor-cars. These premises, being located near the crossings of the main Lithuanian highways and Via Baltica, have a well-developed road infrastructure as well as has very convenient geographical position, with directions to Poland, Byelorussia, the Southern part of Lithuania, Klaipeda, Vilnius, Riga and Kaliningrad.

Another action to reduce the logistics risks was decision for a wider use of outsourcing transport. This important and large-scale procedure will be discussed in detail in another paper. The results of measures to reduce logistics risks are shown in Figure 6.

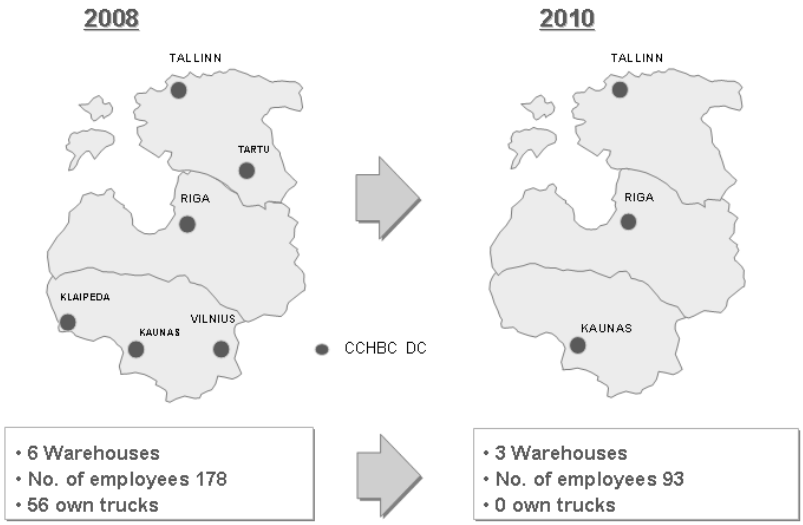

Figure 6: CCHBC distribution infrastructure changes in 2009.

The advantages of Baltic logistics restructuring are as follows.

- Reduced complexity.
- Logistics department ready for possible market changes.
- Lower stock required for Finished Goods (FG).
- Avoiding OOS (Out of Stocks) due to shortage of products in any of the warehouses, as it is not always possible to deliver FG to distribution centres from the Central warehouse in case of extra orders from Key Accounts.
- Reduced costs due to smaller number of direct employees, machinery & supervisors.
- Lower costs for utilities.
- A smaller number of different contract types (forklift gas, stretch film, waste removal, etc)

Due to the restructuring of logistics network good savings have been achieved. Warehousing costs were reduced almost 10 % in 2009 and ~15 % in 2010. The main share in savings comes from the reduced number of employees and shorter mileage between warehouses.

Conclusions:

1. Decrease in the number of warehouses from 6 to 3 will better meet the market changes and reduce the risk of lowering the customer servicing level.
2. Today the model of the central Baltic warehouse should be refused due to equalization of demand over all the three Baltic countries.
3. The new SCM structure will lower the stock of Finished Goods required and make it possible to avoid the Out of Stock for Key Account Supply.

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